. . . connecting your business

# LANCOM IAP-322

**Dual radio industrial access point based on 802.11n in a robust full metal housing for professional WLAN applications**

- Four external antennas for a parallel radio operation at 2.4 and 5 GHz
- Optimized network load at 2.4 GHz through Band Steering
- Connectors for Gigabit Ethernet and Fast Ethernet
- Power supply via 12V power supply unit, multi power supply or Power over Ethernet based on IEEE 802.3af
- Robust, dust-proof full metal housing
- Reliable even at demanding temperatures (-20°C to +50°C)

LANCOM
Systems

With the LANCOM IAP-322 high-performance WLAN structures can be extended to logistics areas such as warehouses or roofed outdoor areas. Thanks to the robust full metal housing the device is resistant against dust as occurring in warehouses. The LANCOM IAP-322 is designed to meet any demands in the industry even with regard to its power supply: It can both be operated with the supplied wall plug transformer (230V/12V) and comfortably via PoE based on IEEE 802.3af. Additionally, a multi power adapter with 10-28V is available in order to connect the device according to the required conditions on-site. The device can even be installed on forklifts and can hence be used for supporting the automatic stocktaking or for locating the vehicle. Due to the implementation of appropriate electronic components, the device can also be applied in sub-zero temperatures and thus also during winter times in unheated warehouses, sport arenas or ice stadiums without interruption. Professional software features such as Band Steering and Spectral Scan contribute to a reliable WLAN operation even in difficult and high-density radio environments.

**More security.**

LANCOM ensures the highest security standards as it supports a comprehensive range of encryption and authentication mechanisms. With the aid of Multi-SSID and protocol filters, up to 16 different user groups can each be assigned with different levels of security. VLAN technology, matured quality-of-service functionalities as well as bandwidth limitation cater for a reliable transmission of video data from warehouse cameras.

**More reliability.**

Especially in logistics areas such as warehouses wireless LANs are a technological challenge: Steel beams create reflections and changing stock positions lead to changes in the radio field. The LANCOM IAP-322 is an access point based on IEEE 802.11n which uses MIMO technology to benefit from reflections to achieve a better radio coverage compared to legacy 54 Mbps devices. Due to the support of Band Steering the radio field can be further optimized: Clients can be steered to either the 2.4 or 5 GHz frequency band to create open radio space for important applications. And in case of occurring interferences, they can be identified quickly with the integrated Spectral Scan – without the need of another cost-intensive radio field analysis.

**More management.**

How much load is there on the network, what are the available data rates? How can you ensure that your well thought-out security policies are consistently implemented throughout the entire corporate network, even across different sites? LANCOM offers a variety of management options for networks of various sizes and in line with the customer's needs: Ranging from free, practical monitoring and configuration tools for very small networks to intelligent controller solutions that offer the cross-site monitoring and management of wireless networks. The IAP-32x series offers the familiar LANCOM flexibility of management: Each access point can be operated in standalone mode and managed with the free administration tools, or it can be centrally managed by a LANCOM WLAN controller. Irrespective of whether the WLAN network is decentralized or centrally managed, a highly specialized monitoring solution is available with LANCOM LSM. This powerful monitoring and surveillance system for medium-sized and large networks is capable of monitoring several thousand devices to give you secure control over your entire network infrastructure. For more information, visit www.lancom.de/en/lsm.

**More reliability for the future.**

LANCOM products are fundamentally designed for a product life spanning several years. They are equipped with hardware dimensioned for the future. Even reaching back to older product generations, updates to the LANCOM Operating System – LCOS – are available several times a year, free of charge and offering major features. LANCOM offers unbeatable protection of your investment!

| WLAN | |
|---|---|
| Frequency band 2.4 GHz and 5 GHz | 2400 -2483.5 MHz (ISM) and 5150-5825 MHz (depending on country-specific restrictions) |
| Data rates 802.11b/g | 54 Mbps to IEEE 802.11g (fallback to 48, 36 , 24, 18, 12, 9, 6 Mbps, Automatic Rate Selection) compatible to IEEE 802.11b (11, 5.5, 2, 1 Mbps, Automatic Rate Selection), 802.11 b/g compatibility mode or pure g or pure b |
| Data rates 802.11a/ h | 54 Mbps (fallback to 48, 36 , 24, 18, 12, 9, 6 Mbps, Automatic Rate Selection), fully compatible with TPC (adjustable power output) and DFS (automatic channel selection, radar detection) according to EN 301 893 |
| Output power at radio module, 2.4 GHz | 802.11b: +19 dBm @ 1 and 2 Mbps, +19 dBm @ 5.5 und 11 Mbps 802.11g: +18 dBm @ 6 to 36 Mbps, +17 dBm @ 48 Mbps, +16 dBm @ 54 Mbps 802.11n: +19 dBm @ 6,5/13 Mbps (MCS0/8, 20 MHz), +10 dBm @ 65/130 Mbps (MCS7/15, 20 MHz), +17 dBm @ 15/30 Mbps (MCS0/8, 40 MHz), +10 dBm @ 150/300 Mbps (MCS7/15, 40 MHz) |
| Output power at radio module, 5 GHz | 802.11a/h: +18 dBm @ 6 to 24 Mbps, +17 dBm @ 36 Mbps, +16 dBm @ 48 Mbps, +15 dBm @ 54 Mbps 802.11n: +18 dBm @ 6,5/13 Mbps (MCS0/8, 20 MHz), +10 dBm @ 65/130 Mbps (MCS7/15, 20 MHz), +17 dBm @ 15/30 Mbps (MCS0/8, 40 MHz), +10 dBm @ 150/300 Mbps (MCS7/15, 40 MHz) |
| Output power at radio module, 2.4 GHz (WLAN-2) | 802.11b: 18 dBm@ 1 and 2 Mbps \| 18 dBm@ 5.5 and 11 Mbps 802.11g: 16 dBm @ 54 Mbps 802.11n: 15 dBm @ 65/130 Mbps (MCS7, 20 MHz) \| 15 dBm @ 150/300 Mbps (MCS7, 40 MHz) |
| Output power at radio module, 5 GHz (WLAN-2) | 802.11a/h: +12 dBm @ 54 Mbps 802.11n: +12 dBm @ 65/130 Mbps (MCS7, 20 MHz)\| +12 dBm @ 150/300 Mbps (MCS7, 40 MHz) |
| Max. radiated power (EIRP), 2.4 GHz band | 802.11b/g: Up to 20 dBm / 100 mW EIRP (transmission power control according to TPC) |
| Max. radiated power (EIRP), 5 GHz band | 802.11a/h: Up to 30 dBm / 1000 mW or up to 36 dBm / 4000 mW EIRP (depending on national regulations on channel usage and subject to further obligations such as TPC and DFS) |
| Minimum transmission power | Transmission power reduction in software in 1 dB steps to min. 0.5 dBm |
| Receiver sensitivity 2.4 GHz | 802.11b: -91 dBm @ 11 Mbps, -96 dBm @ 1 Mbps; 802.11g: -96 dBm @ 6 Mbps, -83 dBm @ 54 Mbps; 802.11n: -96 dBm @ 6,5 Mbps (MCS0, 20 MHz), -79 dBm @ 65 Mbps (MCS7, 20 MHz); -93 dBm @ 13 Mbps (MCS8, 20 MHz), -77 dBm @ 130 Mbps (MCS15, 20 MHz); -90 dBm @ 15 Mbps (MCS0, 40 MHz), -75 dBm @ 150 Mbps (MCS7, 40 MHz); -90 dBm @ 30 Mbps (MCS8, 40 MHz), -73 dBm @ 300 Mbps (MCS15, 40 MHz) |
| Receiver sensitivity 5 GHz | 802.11a/h: -95 dBm @ 6 Mbps, -82 dBm @ 54 Mbps; 802.11n: -95 dBm @ 6,5 Mbps (MCS0, 20 MHz), -77 dBm @ 65 Mbps (MCS7, 20 MHz); -94 dBm @ 13 Mbps (MCS8, 20 MHz), -74 dBm @ 130 Mbps (MCS15, 20 MHz); -91 dBm @ 15 Mbps (MCS0, 40 MHz), -75 dBm @ 150 Mbps (MCS7, 40 MHz); -90 dBm @ 30 Mbps (MCS8, 40 MHz), -71 dBm @ 300 Mbps (MCS15, 40 MHz) |
| Receiver sensitivity 2.4 GHz (WLAN-2) | 802.11b: -90 dBm @11 Mbps 802.11g: -76 dBm @ 54 Mbps 802.11n: -70 dBm @ 65 Mbps (MCS7, 20 MHz)\| -70 dBm @ 150 Mbps (MCS7, 40 MHz) |
| Receiver sensitivity 5 GHz (WLAN-2) | 802.11a/h: -76 dBm @ 54 Mbps 802.11n: -69 dBm@ 65 Mbps (MCS7, 20 MHz) \| -68 dBm @ 150 Mbps (MCS7, 40 MHz) |
| Radio channels 2.4 GHz | Up to 13 channels, max. 3 non-overlapping (depending on country-specific restrictions) |
| Radio channels 5 GHz | Up to 26 non-overlapping channels (available channels and further obligations such as automatic DFS dynamic channel selection depending on national regulations) |
| Band Steering | Steering of WLAN clients towards the 5 GHz frequency band by restricting the access to the 2.4 GHz band. |
| Roaming | Seamless handover between radio cells, IAPP support with optional restriction to an ARF context, IEEE 802.11d support |
| WPA2 fast roaming | Pre-authentication and PMK caching for fast roaming |
| Fast client roaming | With background scanning, moving LANCOM 'client mode' access points pre-authenticate to alternative access points which offer a better signal before Roaming fails |
| VLAN | VLAN ID definable per interface, WLAN SSID, point-to-point connection and routing context (4094 IDs) IEEE 802.1q |
| Dynamic VLAN assignment | Dynamic VLAN assignment for target user groups based on MAC addresses, BSSID or SSID by means of external RADIUS server. |
| Q-in-Q tagging | Support of layered 802.1Q VLANs (double tagging) |
| Multi-SSID | Simultaneous use of up to 8 independent WLAN networks per WLAN interface |
| IGMP snooping | Support for Internet Group Management Protocol (IGMP) in the WLAN bridge for WLAN SSIDs and LAN interfaces for specific switching of multicast packets (devices with integrated WLAN only). Automated detection of multicast groups. Configurable action for multicast packets without registration. Configuration of static multicast group members per VLAN ID. Configuration of query simulation for multicast membership per VLAN ID |
| Security | IEEE 802.11i / WPA2 with passphrase (WPA2-Personal) or 802.1X (WPA2-Enterprise) and hardware-accelerated AES, closed network, WEP64, WEP128, WEP152, user authentication, 802.1x /EAP, LEPS, WPA1/TKIP |
| EAP Types | EAP-TLS, EAP-TTLS/MSCHAPv2, PEAPv0/EAP-MSCHAPv2, PEAPv1/EAP-GTC, EAP-SIM, EAP-AKA, EAP-AKA Prime, EAP-FAST |
| RADIUS server | Integrated RADIUS server for MAC address list management |
| EAP server | Integrated EAP server for authentication of 802.1X clients via EAP-TLS, EAP-TTLS, PEAP, MSCHAP or MSCHAPv2 |
| Quality of Service | Prioritization according to Wireless Multimedia Extensions (WME, subset of IEEE 802.11e) |

# LANCOM IAP-322

Features as of: LCOS 8.82

| WLAN | |
|---|---|
| U-APSD/WMM Power Save | Extension of power saving according to IEEE 802.11e by Unscheduled Automatic Power Save Delivery (equivalent to WMM Power Save). U-APSD supports the automatic switch of clients to a doze mode. Increasmed battery lifetime for telephone calls over VoWLAN (Voice over WLAN) |
| Bandwidth limitation | Maximum transmit and receive rates and an individual VLAN ID can be assigned to each WLAN client (MAC address) |
| Broken link detection | If the link of a chosen LAN interface breaks down, a WLAN module can be deactivated to let the associated clients search for a new base station |
| Background scanning | Detection of rogue AP's and the channel information for all WLAN channels during normal AP operation. The Background Scan Time Interval defines the time slots in which an AP or Router searches for a foreign WLAN network in its vicinity. The time interval can be specified in either milliseconds, seconds, minutes, hours or days |
| Client detection | Rogue WLAN client detection based on probe requests |
| 802.1X supplicant | Authentication of an access point in WLAN client mode at another access point via 802.1X (EAP-TLS, EAP-TTLS and PEAP) |
| Layer-3 Tunneling | Layer-3 Tunneling in conformity with the CAPWAP standard allows the bridging of WLANs per SSID to a separate IP subnet. Layer-2 packets are encapsulated in Layer-3 tunnels and transported to a LANCOM WLAN controller. By doing this the access point is independent of the present infrastructure of the network. Possible applications are roaming without changing the IP address and compounding SSIDs without using VLANs. |
| IEEE 802.11u | The WLAN standard IEEE 802.11u (Hotspot 2.0) allows for a seamless transition from the cellular network into WLAN hotspots. Authentication methods using SIM card information, certificates or username and password, enable an automatic, encrypted login to WLAN hotspots - without the need to manually enter login credentials. |
| **LANCOM Spectral Scan** | |
| RF spectrum scan (WLAN-2 only) | Up to 13 channels (2.4 GHz) or up to 26 channels (5 GHz) (depending on national regulations and manual configuration) |
| Signal strength of WLAN channels (WLAN-2 only) | Illustration of signal strength on individual WLAN channels at a certain point of time |
| **IEEE 802.11n Features** | |
| MIMO | MIMO technology is a technique which uses multiple transmitters to deliver multiple data streams via different spatial channels. Depending on the existing RF conditions the throughput is multiplied with MIMO technology. |
| 40 MHz Channels | Two adjacent 20 MHz channels are combined to create a single 40 MHz channel. Depending on the existing RF Conditions channel bonding doubles the throughput. |
| 20/40MHz Coexistence Mechanisms in the 2.4GHz Band | Support of coexisting accesspoints with 20 and 40MHz channels in 2.4GHz band. |
| MAC Aggregation and Block Acknowledgement | MAC Aggregation increase the 802.11 MAC efficiency by combining MAC data frames and sending it out with a single header. The receiver acknowledges the combined MAC frame with a Block Acknowledgement. Depending on existing RF conditions, this technique improves throughput by up to 20%. |
| Space Time Block Coding (STBC) (WLAN-2 only) | Coding method according to IEEE 802.11n. The Space Time Block Coding improves reception by coding the data stream in blocks. |
| Low Density Parity Check (LDPC) (WLAN-2 only) | Low Density Parity Check (LDPC) is an error correcting method. IEEE 802.11n uses convolution coding (CC) as standard error correcting method, the usage of the more effective Low Density Parity Check (LDPC) is optional. |
| Maximal Ratio Combining (MRC) | Maximal Ratio Combining (MRC) enables the receiver (access point), in combination with multiple antennas, to optimally combine MIMO signals to improve the client reception at long-range. |
| Short Guard Interval | The guard interval is the time between OFDM symbols in the air. 802.11n gives the option for a shorter 400 nsec guard interval compared to the legacy 800 nsec guard interval. Under ideal RF conditions this increases the throughput by upto 10% |
| **WLAN operating modes** | |
| WLAN access point | Infrastructure mode (autonomous operation or managed by LANCOM WLAN Controller) |
| WLAN router | Use of the LAN connector for simultaneous DSL over LAN, IP router, NAT/Reverse NAT (IP masquerading) DHCP server, DHCP client, DHCP relay server, DNS server, PPPoE client (incl.Multi-PPPoE), PPTP client and server, NetBIOS proxy, DynDNS client, NTP, port mapping, policy-based routing based on routing tags, tagging based on firewall rules, dynamic routing with RIPv2, VRRP |
| WLAN client | Transparent WLAN client mode for wireless Ethernet extensions, e.g. connecting PCs or printers by Ethernet; up to 64 MAC addresses. Automatic selection of a WLAN profile (max. 8) with individual access parameters depending on signal strength or priority |
| Spectral Scan (WLAN-2 only) | By scanning the RF spectrum, intererences are identified and graphically illustrated. |
| **Firewall** | |
| Stateful inspection firewall | Incoming/Outgoing Traffic inspection based on connection information. Trigger for firewall rules depending on backup status, e.g. simplified rule sets for low-bandwidth backup lines. Limitation of the number of sessions per remote site (ID) |
| Packet filter | Check based on the header information of an IP packet (IP or MAC source/destination addresses; source/destination ports, DiffServ attribute); remote-site dependant, direction dependant, bandwidth dependant |
| Extended port forwarding | Network Address Translation (NAT) based on protocol and WAN address, i.e. to make internal webservers accessible from WAN |

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| **Firewall** | |
| N:N IP address mapping | N:N IP address mapping for translation of IP addresses or entire networks |
| Tagging | The firewall marks packets with routing tags, e.g. for policy-based routing; Source routing tags for the creation of independent firewall rules for different ARF contexts |
| Actions | Forward, drop, reject, block sender address, close destination port, disconnect |
| Notification | Via e-mail, SYSLOG or SNMP trap |
| **Quality of Service** | |
| Traffic shaping | Dynamic bandwidth management with IP traffic shaping |
| Bandwidth reservation | Dynamic reservation of minimum and maximum bandwidths, totally or connection based, separate settings for send and receive directions. Setting relative bandwidth limits for QoS in percent |
| DiffServ/TOS | Priority queuing of packets based on DiffServ/TOS fields |
| Packet-size control | Automatic packet-size control by fragmentation or Path Maximum Transmission Unit (PMTU) adjustment |
| Layer 2/Layer 3 tagging | Automatic or fixed translation of layer-2 priority information (IEEE 802.11p-marked Ethernet frames) to layer-3 DiffServ attributes in routing mode. Translation from layer 3 to layer 2 with automatic recognition of 802.11p-support in the destination device |
| **Security** | |
| Intrusion Prevention | Monitoring and blocking of login attempts and port scans |
| IP spoofing | Source IP address check on all interfaces: only IP addresses belonging to the defined IP networks are allowed |
| Access control lists | Filtering of IP or MAC addresses and preset protocols for configuration access |
| Denial of Service protection | Protection from fragmentation errors and SYN flooding |
| General | Detailed settings for handling reassembly, PING, stealth mode and AUTH port |
| URL blocker | Filtering of unwanted URLs based on DNS hitlists and wildcard filters |
| Password protection | Password-protected configuration access can be set for each interface |
| Alerts | Alerts via e-mail, SNMP-Traps and SYSLOG |
| Authentication mechanisms | EAP-TLS, EAP-TTLS, PEAP, MS-CHAP, MS-CHAPv2 as EAP authentication mechanisms, PAP, CHAP, MS-CHAP and MS-CHAPv2 as PPP authentication mechanisms |
| WLAN protocol filters | Limitation of the allowed transfer protocols, source and target addresses on the WLAN interface |
| Adjustable reset button | Adjustable reset button for 'ignore', 'boot-only' and 'reset-or-boot' |
| IP redirect | Fixed redirection of any packet received over the WLAN interface to a dedicated target address |
| **High availability / redundancy** | |
| VRRP | VRRP (Virtual Router Redundancy Protocol) for backup in case of failure of a device or remote station. Enables passive standby groups or reciprocal backup between multiple active devices including load balancing and user definable backup priorities |
| FirmSafe | For completely safe software upgrades thanks to two stored firmware versions, incl. test mode for firmware updates |
| Line monitoring | Line monitoring with LCP echo monitoring, dead-peer detection and up to 4 addresses for end-to-end monitoring with ICMP polling |
| **Routing functions** | |
| Router | IP and NetBIOS/IP multi-protocol router |
| Advanced Routing and Forwarding | Separate processing of 16 contexts due to virtualization of the routers. Mapping to VLANs and complete independent management and configuration of IP networks in the device, i.e. individual settings for DHCP, DNS, Firewalling, QoS, VLAN, Routing etc. Automatic learning of routing tags for ARF contexts from the routing table |
| HTTP | HTTP and HTTPS server for configuration by web interface |
| DNS | DNS client, DNS server, DNS relay, DNS proxy and dynamic DNS client |
| DHCP | DHCP client, DHCP relay and DHCP server with autodetection. Cluster of several LANCOM DHCP servers per context (ARF network) enables caching of all DNS assignments at each router. DHCP forwarding to multiple (redundant) DHCP servers |
| NetBIOS | NetBIOS/IP proxy |
| NTP | NTP client and SNTP server, automatic adjustment for daylight-saving time |
| Policy-based routing | Policy-based routing based on routing tags. Based on firewall rules, certain data types are marked for specific routing, e.g. to particular remote sites or lines |

# LANCOM IAP-322

Features as of: LCOS 8.82

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|---|---|
| **Routing functions** | |
| Dynamic routing | Dynamic routing with RIPv2. Learning and propagating routes; separate settings for LAN and WAN. Extended RIPv2 including HopCount, Poisoned Reverse, Triggered Update for LAN (acc. to RFC 2453) and WAN (acc. to RFC 2091) as well as filter options for propagation of routes. Definition of RIP sources with wildcards |
| DHCPv6 | DHCPv6 client, DHCPv6 server, DHCPv6 relay, stateless- and stateful mode, IPv6 address (IA_NA), prefix delegation (IA_PD), DHCPv6 reconfigure (server and client) |
| **Layer 2 functions** | |
| ARP lookup | Packets sent in response to LCOS service requests (e.g. for Telnet, SSH, SNTP, SMTP, HTTP(S), SNMP, etc.) via Ethernet can be routed directly to the requesting station (default) or to a target determined by ARP lookup |
| LLDP | Automatic discovery of network topology in layer 2 networks (Link Layer Discover Protocol). |
| **LAN protocols** | |
| IP | ARP, proxy ARP, BOOTP, DHCP, DNS, HTTP, HTTPS, IP, ICMP, NTP/SNTP, NetBIOS, PPPoE (server), RADIUS, RIP-1, RIP-2, RTP, SIP, SNMP, TCP, TFTP, UDP, VRRP, VLAN |
| Rapid Spanning Tree | 802.1d Spanning Tree and 802.1w Rapid Spanning Tree support for dynamic path selection with redundant layer 2 connections |
| IPv6 | NDP, stateless address autoconfiguration (SLAAC), stateful address autoconfiguration (with DHCPv6), router advertisements, ICMPv6, DHCPv6, DNS, HTTP, HTTPS, PPPoE, TCP, UDP |
| **IPv6** | |
| Dual Stack | IPv4/IPv6 dual stack |
| IPv6 compatible LCOS applications | WEBconfig, HTTP, HTTPS, SSH, Telnet, DNS, TFTP, Firewall |
| **WAN protocols** | |
| Ethernet | PPPoE, Multi-PPPoE, ML-PPP, PPTP (PAC or PNS) and IPoE (with or without DHCP), RIP-1, RIP-2, VLAN, IP |
| IPv6 | IPv6 over PPP (IPv6 and IPv4/IPv6 dual stack session), IPoE (autoconfiguration, DHCPv6 or static) |
| Tunneling protocols (IPv4/IPv6) | 6to4, 6in4, 6rd (static and via DHCP) |
| **WAN operating mode** | |
| xDSL (ext. modem) | ADSL1, ADSL2 or ADSL2+ with external ADSL2+ modem |
| **Interfaces** | |
| ETH1 | 10/100/1000 Mbps, auto-sensing algorithm |
| ETH2 | 10/100 Mbps, auto-sensing algorithm |
| External antenna connectors | Four reverse SMA connectors for external LANCOM AirLancer Extender antennas or for antennas from other vendors. Please respect the restrictions which apply in your country when setting up an antenna system. For information about calculating the correct antenna setup, please refer to www.lancom-systems.com |
| **LCMS (LANCOM Management System)** | |
| LANconfig | Configuration program for Microsoft Windows, incl. convenient Setup Wizards. Optional group configuration, simultaneous remote configuration and management of multiple devices over IP connection (HTTPS, HTTP, TFTP). A tree view of the setting pages like in WEBconfig provides quick access to all settings in the configuration window. Password fields which optionally display the password in plain text and can generate complex passwords. Configuration program properties per project or user. Automatic storage of the current configuration before firmware updates. Exchange of configuration files between similar devices, e.g. for migrating existing configurations to new LANCOM products. Detection and display of the LANCOM managed switches. Extensive application help for LANconfig and parameter help for device configuration. LANCOM QuickFinder as search filter within LANconfig and device configurations that reduces the view to devices with matching properties |
| LANmonitor | Monitoring application for Microsoft Windows for (remote) surveillance and logging of the status of LANCOM devices and connections, incl. PING diagnosis and TRACE with filters and save to file. Search function within TRACE tasks. Wizards for standard diagnostics. Export of diagnostic files for support purposes (including bootlog, sysinfo and device configuration without passwords). Graphic display of key values (marked with an icon in LANmonitor view) over time as well as table for minimum, maximum and average in a separate window, e. g. for Rx, Tx, CPU load, free memory. Monitoring of the LANCOM managed switches. Flick easily through different search results by LANCOM QuickFinder |
| WLANmonitor | Monitoring application for Microsoft Windows for the visualization and monitoring of LANCOM WLAN installations, incl. Rogue AP and Rogue Client visualization. LANCOM QuickFinder as search filter that reduces the view to devices with matching properties |
| Firewall GUI | Graphical user interface for configuring the object-oriented firewall in LANconfig: Tabular presentation with symbols for rapid understanding of objects, choice of symbols for objects, objects for actions/Quality of Service/remote sites/services, default objects for common scenarios, individual object definition (e.g. for user groups) |
| Automatic software update | Voluntary automatic updates for LCMS. Search online for LCOS updates for devices managed by LANconfig on the myLANCOM download server (myLANCOM account mandatory). Updates can be applied directly after the download or at a later time |

| Management | |
|---|---|
| WEBconfig | Integrated web server for the configuration of LANCOM devices via Internet browsers with HTTPS or HTTP. Similar to LANconfig with a system overview, syslog and events display, symbols in the menu tree, quick access with side tabs. WEBconfig also features Wizards for basic configuration, security, Internet access, LAN-LAN coupling. Online help for parameters in LCOS menu tree |
| LANCOM Layer 2 Management (emergency management) | The LANCOM Layer 2 Management protocol (LL2M) enables an encrypted access to the command line interface of a LANCOM device directly via a Layer 2 connection |
| Alternative boot configuration | During rollout devices can be preset with project- or customer-specific settings. Up to two boot- and reset-persistent memory spaces can store customized configurations for customer-specific standard settings (memory space '1') or as a rollout configuration (memory space '2'). A further option is the storage of a persistent standard certificate for the authentication of connections during rollouts |
| Device Syslog | Syslog buffer in the RAM (size depending on device memory) to store events for diagnosis. Default set of rules for the event protocol in Syslog. The rules can be modified by the administrator. Display and saving of internal Syslog buffer (events) from LANCOM devices with LANmonitor, display only with WEBconfig |
| Access rights | Individual access and function rights for up to 16 administrators. Alternative access control on a per parameter basis with TACACS+ |
| User administration | RADIUS user administration for dial-in access (PPP/PPTP). Support for RADSEC (Secure RADIUS) providing secure communication with RADIUS servers |
| Remote maintenance | Remote configuration with Telnet/SSL, SSH (with password or public key), browser (HTTP/HTTPS), TFTP or SNMP, firmware upload via HTTP/HTTPS or TFTP |
| TACACS+ | Support of TACACS+ protocol for authentication, authorization and accounting (AAA) with reliable connections and encrypted payload. Authentication and authorization are separated completely. LANCOM access rights are converted to TACACS+ levels. With TACACS+ access can be granted per parameter, path, command or functionality for LANconfig, WEBconfig or Telnet/SSH. Each access and all changes of configuration are logged. Access verification and logging of SNMP Get and Set requests. WEBconfig supports the access rights of TACACS+ and choice of TACACS+ server at login. LANconfig provides a device login with the TACACS+ request conveyed by the addressed device. Authorization to execute scripts and each command within them by checking the TACACS+ server's database. CRON, action-table and script processing can be diverted to avoid TACACS+ to relieve TACACS+ servers. Redundancy by setting several alternative TACACS+ servers. Configurable option to fall back to local user accounts in case of connection drops to the TACACS+ servers. Compatibility mode to support several free TACACS+ implementations |
| Remote maintenance of 3rd party devices | A remote configuration for devices behind der LANCOM can be accomplished (after authentication) via tunneling of arbitrary TCP-based protocols, e.g. for HTTP(S) remote maintenance of VoIP phones or printers of the LAN. Additionally, SSH and Telnet client allow to access other devices from a LANCOM device with an interface to the target subnet if the LANCOM device can be reached at its command line interface |
| TFTP & HTTP(S) client | For downloading firmware and configuration files from a TFTP, HTTP or HTTPS server with variable file names (wildcards for name, MAC/IP address, serial number), e.g. for roll-out management. Commands for live Telnet session, scripts or CRON jobs. HTTPS Client authentication possible by username and password or by certificate |
| SSH & Telnet client | SSH-client function compatible to Open SSH under Linux and Unix operating systems for accessing third-party components from a LANCOM router. Also usable when working with SSH to login to the LANCOM device. Support for certificate- and password-based authentication. Generates its own key with sshkeygen. SSH client functions are restricted to administrators with appropriate rights. Telnet client function to login/administer third party devices or other LANCOM devices from command line interface |
| HTTPS Server | Option to choose if an uploaded certificate or the default certificate is used by the HTTPS server |
| Large Scale Monitor (LSM) | The LANCOM Large Scale Monitor (LSM) is a professional tool for monitoring medium-sized to large-scale networks with 25 to 1,000 network components. Designed especially for LANCOM components including WLAN access points, controllers, switches, and routers, this system based on open-source components additionally allows for the monitoring of third-party products such as servers and printers. Problems in the network are clearly displayed in tables or graphical floor plans, and they trigger alert messages via e-mail if certain threshold values are not maintained. |
| Security | Access rights (read/write) over WAN or (W)LAN can be set up separately (Telnet/SSL, SSH, SNMP, HTTPS/HTTP), access control list |
| Scripting | Scripting function for batch-programming of all command-line parameters and for transferring (partial) configurations, irrespective of software versions and device types, incl. test mode for parameter changes. Utilization of timed control (CRON) or connection establishment and termination to run scripts for automation. Scripts can send e-mails with various command line outputs as attachments |
| Load commands | LoadFirmware, LoadConfig and LoadScript can be executed conditionally in case certain requirements are met. For example, the command LoadFirmware could be executed on a daily basis and check each time if the current firmware is up to date or if a new version is available. In addition, LoadFile allows the upload of files including certificates and secured PKCS#12 containers |
| SNMP | SNMP management via SNMPv2, private MIB exportable by WEBconfig, MIB II |
| Timed control | Scheduled control of parameters and actions with CRON service |
| Diagnosis | Extensive LOG and TRACE options, PING and TRACEROUTE for checking connections, LANmonitor status display, internal logging buffer for SYSLOG and firewall events, monitor mode for Ethernet ports |
| LANCOM WLAN Controller | Supported by all LANCOM WLAN Controller (separate optional hardware equipment for installation, optimization, operating and monitoring of WLAN networks, except for P2P connections) |
| **Statistics** | |
| Statistics | Extensive Ethernet, IP and DNS statistics; SYSLOG error counter |
| Accounting | Connection time, online time, transfer volumes per station. Snapshot function for regular read-out of values at the end of a billing period. Timed (CRON) command to reset all counters at once |

# LANCOM IAP-322

Features as of: LCOS 8.82

| | |
|---|---|
| **Statistics** | |
| Export | Accounting information exportable via LANmonitor and SYSLOG |
| **Hardware** | |
| Dimensions | 207 mm x 148 mm x 44 mm (Length/Width/Height) |
| Weight | approximately 1.2 kg excluding mounting material |
| LED display | 5 LEDs for Power, Ethernet 1, Ethernet 2, WLAN1 and WLAN2 |
| Power supply | 12 V DC, external power adapter (230 V) with bayonet cap to protect against accidentally unplugging |
| Power supply | 24 V DC, input voltage range 10 - 28 V |
| Power supply | Via Power over Ethernet, compliant with IEEE 802.3af |
| Reset button | Configurable reset switch for resetting and booting the device |
| Environment | Temperature range -20 – +50° C; humidity 0–95%; non-condensing, please note that depending on the intended use your power supply has to support the extended temperature range |
| Housing | Robust metal housing, IP 50 protection rating, ready for wall, pole and top-hat rail mounting |
| Power consumption (max) | approx. 12 Watts with 12 V/ 1 A power supply adapter (total power consumption of access point and power supply adapter), approx. 12.95 Watts via PoE |
| **Declarations of conformity*** | |
| CE | EN 60950-1, EN 301 489-1, EN 301 489-17 |
| UL | UL-2043 |
| 2.4 GHz WLAN | EN 300 328 |
| 5 GHz WLAN | EN 301 893 |
| Notifications | Certifications notified in Germany, Belgium, Netherlands, Luxembourg, Austria, Switzerland, UK, Italy, Spain, France, Portugal, Czech Republic, Denmark |
| IPv6 | IPv6 Ready Gold |
| *) Note | You will find all declarations of conformity in the products section of our website at www.lancom-systems.eu |
| **Scope of delivery** | |
| Manual | Hardware Quick Reference (EN, DE), Installation Guide (DE/EN/FR/ES/IT/PT/NL) |
| CD/DVD | Data medium with management software (LANconfig, LANmonitor, WLANmonitor, LANCAPI) and documentation |
| Cable | 1 Ethernet cable, 3 m |
| Plug | 2-pin plug to connect with multi-voltage power supply unit with screwed connection |
| Mounting Kit | Mounting kit for wall, pole and top hat rail mounting |
| Antennas | Four 4-5 dBi dipole antennas (Gain depends on frequency.) |
| Power supply unit | External power adapter (230 V), NEST 12 V/1.5 A DC/S, coaxial power connector 2.1/5.5 mm bayonet, temperature range from -5 to +45° C, LANCOM item no. 110723 (EU)/LANCOM item no 110829 (UK) (not included in bulk delivery) |
| Ferrite | The ferrite (order number 74272722 at Würth Elektronik) must be attached to the Ethernet cable. Please mind the bend radius of the Ethernet cable. |
| **Support** | |
| Warranty | 3 years Support via Hotline and Internet KnowledgeBase |
| Software updates | Regular free updates (LCOS operating system and LANCOM Management System) via Internet |
| **Options** | |
| Advance Replacement | LANCOM Next Business Day Service Extension IAP & OAP, item no. 61412 |
| Warranty Extension | LANCOM 2-Year Warranty Extension IAP & OAP, item no. 61415 |
| Public Spot | LANCOM Public Spot Option (authentication and accounting software for hotspots, incl. Voucher printing through Standard PC printer), item no. 60642. |

| Accessories | |
|---|---|
| LANCOM Large Scale Monitor | Powerful monitoring system for WLAN, VPN, and LAN infrastructures of mid-sized to large networks, upgradable for up to 1000 monitored devices, for a proactive error management, browser-based remote monitoring, intuitive user interface, graphic floorplans, configurable triggers for alarms and messages, users, roles, and rights management, item no. 62910 |
| LANCOM WLC-4006+ (EU/UK/US) | LANCOM WLAN controller for central management of 6 (opt. up to 30) LANCOM access points and WLAN routers, item no. 62035 (EU), item no. 62036 (UK) and item no. 62037 (US) |
| LANCOM WLC-4025+ (EU/UK/US) | LANCOM WLAN controller for central management of 25 (opt. up to 100) LANCOM access points and WLAN routers, item no. 61378, item no. Art.-Nr. 61379 and item no. 61384 (US) |
| LANCOM WLC-4025 (EU/UK) | LANCOM WLAN controller for central management of 25 (opt. up to 100) LANCOM access points and WLAN routers, item no. 61550 (EU) and item no. 61551 (UK) - only stock devices, article is no longer available |
| LANCOM WLC-4100 (EU/UK) | LANCOM WLAN controller for central management of 100 (opt. up to 1000) LANCOM access points and WLAN routers, item no. 61369 (EU) and item no. 61377 (UK) |
| External antenna | AirLancer Extender O-30 2.4 GHz outdoor antenna, item no. 60478 |
| External antenna | AirLancer Extender O-70 2.4 GHz outdoor antenna, item no. 60469 |
| External antenna | AirLancer Extender O-9a 5 GHz outdoor antenna, item no. 61220 |
| External antenna | AirLancer Extender O-18a 5 GHz outdoor antenna, item no. 61210 |
| External antenna* | AirLancer Extender O-D80g 2.4 GHz 'dual linear' polarisation diversity outdoor sector antenna, item no. 61221 |
| External antenna* | AirLancer Extender O-D60a 5 GHz 'dual linear' polarisation diversity outdoor sector antenna, item no. 61222 |
| External antenna | AirLancer Extender O-360ag dual-band omnidirectional outdoor antenna, item no. 61223 |
| External antenna | AirLancer Extender I-60ag dual-band indoor sector antenna, item no. 61214 |
| External antenna | AirLancer Extender I-180 omnidirectional 2.4 GHz indoor antenna, item no. 60914 |
| External antenna | AirLancer Extender I-D180agn dual-band indoor antenna, item no. 60917 |
| External antenna | AirLancer Extender I-360 omnidirectional 2.4 GHz indoor antenna, item no. 00745 |
| External antenna* | AirLancer Extender O-D9a 5 GHz 'dual linear' polarisation diversity outdoor antenna, item no. 61224 |
| External antenna | AirLancer Extender O-360-3G 4 dBi omnidirectional GSM/GPRS/EDGE/3G outdoor antenna, item no. 61225 |
| External antenna | AirLancer Extender I-360-3G 2dBi GSM/GPRS/EDGE, 5dBi 3G, omnidirectional indoor antenna, item no. 60916 |
| External antenna | AirLancer Extender O-360-3G omnidirectional GSM/GPRS/EDGE/3G/LTE outdoor antenna, item no. 61227 |
| External antenna | AirLancer Extender I-360-4G, +2.5 dBi 4G/3G/2G antenna, 698-960 and 1710-2700 MHz, omnidirectional MIMO indoor antenna, item no. 60918 |
| Antenna cable | AirLancer cable NJ-NP 3m antenna cable extension for connection with LANCOM outdoor antennas, item no. 61230 |
| Antenna cable | AirLancer cable NJ-NP 6m antenna cable extension for connection with LANCOM outdoor antennas, item no. 61231 |
| Antenna cable | AirLancer cable NJ-NP 9m antenna cable extension for connection with LANCOM outdoor antennas, item no. 61232 |
| Surge arrestor (antenna cable) | AirLancer Extender SA-5L surge arrestor (2.4 and 5 GHz), to be integrated between Access Point and antenna, item no. 61553 |
| Surge arrestor (LAN cable) | AirLancer Extender SA-LAN surge arrestor (LAN cable), item no. 61213 |
| LANCOM IAP PSU (EU, bulk 5) | 5 x 230 V Power Supply Units for IAP-321/IAP-322, EU variant, item no. 61812 |
| LANCOM IAP PSU (UK, bulk 5) | 5 x 230 V Power Supply Units for IAP-321/IAP-322, UK variant, item no. 61813 |
| Power over Ethernet Injector | LANCOM GE PoE Power Injector, item no. 61554 (EU) and 61555 (UK) |
| *) Note | The Polarization Diversity antennas require 2 cables and surge arrestors |
| **Item number(s)** | |
| LANCOM IAP-322 (EU) | 61388 |
| LANCOM IAP-322 (UK) | 61389 |
| LANCOM IAP-322, 5-piece bulk (Ethernet cables, power supply, DVD and documentation are not included in package content) | 61399 |

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